Corectia TE1 - MAT1 - C

Ex1 a) $f(x) = \frac{1}{\sqrt{x+x^3}}$ $\quad D(f)$?

$x + x^3 > 0 \qquad x(1+x^2) > 0 \qquad 1+x^2 > 0$

dar $x > 0$

$D(f) =]0, +\infty[$

b) $g(x) = \ln\left(\frac{x^2-3x+2}{x+1}\right)$

$\frac{x^2-3x+2}{x+1} > 0$ $\quad$ si $x+1 \neq 0$

$A = \frac{(x-1)(x-2)}{x+1} > 0$

x	$-\infty$		-1		1		2		$+\infty$
$x+1$		$-$	‖	$+$		$+$		$+$	
$(x-1)(x-2)$		$+$	‖	$+$	0	$-$	0	$+$	
A		$-$	‖	$+$	0	$-$	0	$+$	

$D(g) =]-1, 1[\cup]2, +\infty[$

Ex2 a) $f(x) = \sqrt[3]{x^3 - x}$

$f(-x) = \sqrt[3]{(-x)^3 - (-x)} = -\sqrt[3]{x^3 - x} = -f(x)$

impara

b) $f(x) = e^{[x]} - e^{-[x]}$

$f(0,5) = 1 - 1 = 0$

$f(-0,5) = e^{-1} - e^{1} \neq 0$

ni para, ni impara.

c) $f(x) = (1+x)^3$ $\qquad f(1) = 2^3 = 8 \qquad f(-1) = 0$

ni para, ni impara

d) $f(x) = \sqrt{x^4 - x^2 + 1}$ $\qquad f(-x) = \sqrt{(-x)^4 - (-x)^2 + 1}$

$= f(x)$

Ex3 a) $\log(x^2-7) = 2\log(x+3)$ CE $x^2-7>0$

$x+3>0$

$\log(x^2-7) = \log((x+3)^2)$

$x^2-7 = x^2+6x+9$

$6x = -16$ $x = -\frac{16}{6} = -\frac{8}{3}$

Vérifie CE

$S = \{-\frac{8}{3}\}$

b) voir TE1 - MAT1 - D

Ex4 $f(x) = \frac{x^3+3x^2-4}{x^2-x-2}$

a) $x^2-x-2 \neq 0$

$(x+1)(x-2) \neq 0$ $D(f) = \mathbb{R} \setminus \{-1; 2\}$

b) $x^3+3x^2-4 = 0$

$x^3+3x^2-4 = (x+2)^2(x-1)$

-2 zéro double

1 zéro simple

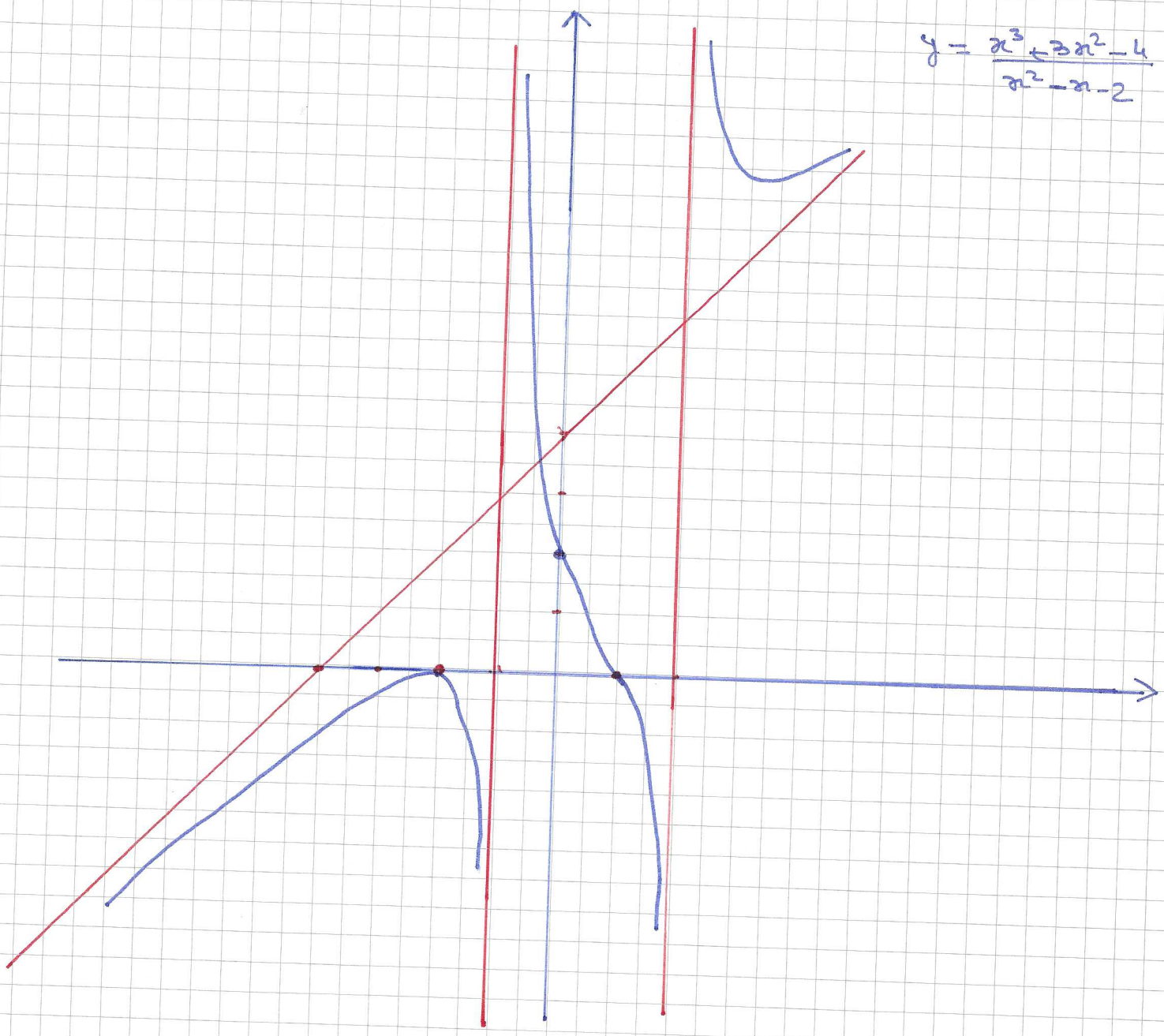
c) ni paire, ni impaire

d) $x=-1$ et $x=2$ asymptotes verticales

e) $y = x+4$ asymptote oblique

(division euclidienne)

f) $f(0) = 2$



Ex 5

$(f \circ g)(x) = f(x^2+1) = \ln(x^2+1-2) = \ln(x^2-1)$

$D(f \circ g) =]-\infty, -1[\cup]1, +\infty[$

$(g \circ f)(x) = g(f(x)) = g(\ln(x-2)) \quad x > 2$

$= (\ln(x-2))^2 + 1 \quad x > 2$

$D(g \circ f) =]2, +\infty[$